From: Stephen Healy
To: Jason Gumbs
Subject: Fw: SCR Catalyst Question
Date: 03/05/2010 09:35 AM
Attachments: HUC formation 2009.01.20.pdf

Jason,

Deliberative Process / Ex. 5

Steve Healy
Mechanical Engineer
USEPA, Office of Transportation and Air Quality
CISD, Light-Duty Vehicle Group
(734) 214-4121

----- Forwarded by Stephen Healy/AA/USEPA/US on 03/05/2010 09:22 AM -----

From: rob.sutschek@gm.com
To: randall.c.harvey@gm.com, Stephen Healy/AA/USEPA/US@EPA
Cc: andrew.s.barren@gm.com
Date: 02/08/2010 03:24 PM
Subject: Re: Fw: SCR Catalyst Question

Randy -

I had been gathering information on this subject since our meeting with C-ARB. I have summary data from Dave Brown (technical fellow) and Dr Shouxian Ren (design release engineer for the SCR). An internal testing protocol is being coordinated by Thomas Krieger of GM-Europe/Opel (Russelsheim). I believe our January 2009 conclusion was that GM has no concerns per our cooperative testing with MECA (www.MECA.org) and the EPA.

We specifically turn toward Engelhard (BASF) to conduct the cooperative MECA testing for further EPA decision and guidance.

Steve - Yes, our 2011 Diesel products will be utilizing a **CBI / Ex. 4**
Below is an email from January 30, 2009. Please let me know if you need more specifics or contact information regarding our involvement in the Cu-Z investigation.

CBI / Ex. 4

Forward of Email 1/30/2009 from Shouxian Ren of GMPT Aftertreatment -

The BASF Dioxin conference call was held yesterday. Michael Luckham, Dave Brown, Jim Li and Shouxian Ren attended the call.

Dr. Marius Vaarkamp made presentation titled "Potential for Creating HUCs with Cu Containing SCR Catalysts" (attached). HUCs refers to Highly Undesirable Compounds including chlorinated Dioxins and Furans.

Key points of discussion are summarized below:
1. Theoretically, Dioxin type of cyclic hydrocarbons should not survive diesel combustion process, as well as DOC or DPF catalytic oxidation reactions. The presence of DOC and DPF, such as in our 2010i Diesel AT systems, shall reduce the potential of tailpipe Dioxins emissions.
2. The chlorine content (<200ppm) in a Cu-Z SCR washcoat has low likelihood for catalyzing Dioxin formation due to thermal decomposition of copper chloride (CuCl or CuCl2) when exposed to a typical DPF reg temperature.
3. **Dioxin discussions were held between BASF and EPA technical staff in 2007. At that time, the opinion was that** Deliberative Process / Ex. 5 **on GM 2010i emissions systems would not be an issue.**
4. EPA tested a BASF Cu containing SCR (for off-highway applications) previously. The results showed higher dioxin levels than expected. However, the engine_out and background measurements were missing, therefore, it was inconclusive.
5. **EPA is currently conducting Dioxin engine-dyno experiment by cooperating with MECA and EMA:**
i) BASF, along with other catalyst suppliers, has submitted its Cu-Z SCR and Fe-Z SCR catalysts to MECA for supporting the EPA experiment. However, it is unclear which SCR technologies EPA has been actually testing with.
ii) There is no diesel Dioxins emissions target with EPA. For the time being, EPA just wants to understand if a zeolite SCR could actually form dioxins under diesel operating conditions with and w/o urea injection. The impact of DOC and DPF on Dioxins emissions are being investigated as well.
iii) EPA has its own complex Dioxins sampling procedure and analysis method.
iv) The EPA Dioxin experiment is now finishing up.
6. BASF will consider an individual Dioxin study if the EPA testing results indicated high risk for Cu-Z SCR diesel applications.
7. BASF will keep informing GMPT for the latest SCR Dioxins emissions investigation.

Please review the BASF presentation and feel free to ask any questions.

Thanks for attention.
Regards,

Shouxian Ren
GMPT Aftertreatment
823 Joslyn Road
Pontiac, MI 48340
734-368-3141 (Cell)
248-857-4441 (Fax)
shouxian.ren@gm.com

Steve - Please contact me if you need me to get you MECA, BASF or EPA contacts involved in these discussions.

Thank you -
Rob
734-368-3142

----- Forwarded by Randall C. Harvey/US/GM/GMC on 02/08/2010 01:27 PM -----
Healy.Stephen@epamail.epa.gov

02/08/2010 01:03 PM

To "Randy Harvey" <randall.c.harvey@gm.com>
cc
Subject SCR Catalyst Question

Randy,

Does the upcoming HD chassis cert diesel product use a copper-zeolite SCR catalyst? If so, has GM submitted to the EPA any dioxin emission test data? I have attached a guidance letter, CISD-08-17, that requests that manufacturers using copper -zeolite catalysts to demonstrate that the catalyst for this application does not increase dioxin emissions. This data will be required for the certification of any copper-zeolite SCR catalyst equipped vehicles. Please contact me if you have any questions.

Steve Healy
Mechanical Engineer
USEPA, Office of Transportation and Air Quality
CISD, Light-Duty Vehicle Group
(734) 214-4121

(See attached file: CISD -08-17.pdf)


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